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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/069,310	05/14/2002	Martin Maier	2024	1955

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EXAMINER
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GORMAN, DARREN W

ART UNIT	PAPER NUMBER
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3752

DATE MAILED: 02/18/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/069,310

Applicant(s)

MAIER ET AL.

Examiner

Darren W Gorman

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
  - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
  - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
  - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 22-42 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 22-42 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 2 and 6.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

## **DETAILED ACTION**

### ***Information Disclosure Statement***

1 The IDS filed on February 11, 2002, paper #2, and the IDS filed on May 14, 2002, paper #6 are hereby acknowledged and have been placed of record. Please find attached a signed and initialed copy of each PTO 1449.

### ***Claim Objections***

2. Claim 23 is objected to because of the following informalities:

Claim 23 recites "said at least one outlet opening is provided precisely upstream of said valve seat". This is confusing because Applicant's disclosure and drawings show that the outlet opening (32) is located downstream of the valve seat (27). Furthermore, this claim is contradictory with claim 22 from which it depends, which recites, "at least one outlet opening as a fuel outlet provided downstream of the valve seat". Claim 23 will be examined as understood to mean "downstream" since the valve would be inoperable if the outlet opening were located upstream of the seat.

Appropriate correction is required.

### ***Minor Claim Suggestions By Examiner***

3. The body of the claims of the present invention is understood by the Examiner, however the following changes are recommended to improve clarity. The claims have been examined on the merits including the suggested changes below.

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In claim 37, line 2, [metal] should be replaced with --method--.

***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 22-32, and 37 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Okamoto et al., USPN 5,108,037.

Regarding claims 22-31, Okamoto shows a fuel injection valve (see Figures 1, 2, and 4) comprising: an excitable actuating device (11); a valve closing member (2); a valve seat element (4); a swirl element (6) located in a channel (7) having a circular cross section; at least one outlet opening (5) provided in the valve seat element downstream of the valve seat (4), the outlet opening having on its ejection end a recessed outlet region with a parameter which deviates from a remaining part of the outlet opening, and the swirl element located upstream of the outlet opening, wherein the outlet region is polygonal, with a first portion having a circular cross section, and a second portion having a widening shape, the first portion having an upper contoured portion being curved in a concave manner; and an ejection region downstream of the valve seat element, the outlet opening arranged in the ejection region.

Regarding claims 32 and 37, the fuel injection valve of Okamoto is structurally the same as the fuel injection valve defined and manufactured by the method of claims 32 and 37. The first method step is met because there is a through hole formed in the injection valve of

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Okamoto. The second method step is met because the outlet region of Okamoto, having a varied parameter which varies in shape, size, and contour, would necessarily be created from an injection end since the outlet region is of a substantially larger cross section than the outlet opening.

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 33-36, and 38-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okamoto, in view of Haas et al., USPN 6,065,203.

Regarding claims 33-36, as discussed above, Okamoto teaches the steps of manufacturing the fuel injection valve as set forth in claim 32, however Okamoto does not expressly teach the method steps including recessing the through hole and/or outlet region by using any of the boring processes recited in claims 33-36.

Haas teaches a method of fabricating very small and precise passages through a solid article, the method including fabricating a passage from a first side and then fabricating a recess from a second, opposite side, resulting in a through hole through the article (see column 2, lines 35-40). Haas further teaches the method for use in fabricating passages for nozzle structures including a nozzle structure for a fuel injector (see column 9, lines 11-18). Still further, the method taught by Haas includes creating the aforementioned passages using non-metal cutting

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production processes including using highly focused, high-energy radiation beams which are more precise for precision contouring than conventional methods of manufacture (see column 13, line 41-54), and Haas further suggests using EDM wire to fabricate internal features (see column 13, lines 55-57).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to manufacture the precise through hole and/or outlet region of Okamoto, using the methods taught by Haas, in order to create more precise contouring which would be more difficult to manufacture using conventional processes.

Regarding claims 38-42, as discussed above, the fuel injection valve of Okamoto is structurally the same as the fuel injection valve defined and manufactured by the method of claim 32. However, the fuel injection valve of Okamoto, although structurally the same again as the fuel injection valve defined and manufactured by the method of claim 38, would not necessarily be manufactured by first creating a blind bore from the inlet side, and then creating the outlet region by recessing from the injection end far enough to create a continuous outlet opening. Further, Okamoto does not expressly teach the method steps including creating the through hole and/or outlet region by using any of the boring processes recited in claims 39-42.

Haas teaches a method of fabricating very small and precise passages through a solid article, the method including fabricating a blind bore passage from a first side and then fabricating a recess from a second, opposite side, resulting in a continuous outlet opening through the article (see column 2, lines 35-40; and column 10, line 66 through column 11, line 17). Haas further teaches the method for use in fabricating passages for nozzle structures including a nozzle structure for a fuel injector (see column 9, lines 11-18). Still further, the

method taught by Haas includes creating the aforementioned passages using non-metal cutting production processes including using highly focused, high-energy radiation beams which are more precise for precision contouring than conventional methods of manufacture (see column 13, line 41-54), and Haas further suggests using EDM wire to fabricate internal features (see column 13, lines 55-57).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to manufacture the precise through hole and/or outlet region of Okamoto, using the methods taught by Haas, in order to create more precise contouring which would be more difficult to manufacture using conventional processes.

### ***Conclusion***

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US Patents to Nakamura et al., Okamoto et al., Horsting, Reiter, Cerny et al., and Tani et al. are cited as of interest.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Darren W Gorman whose telephone number is 703-306-4205. The examiner can normally be reached on M-F 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Mar can be reached on 703-308-2087. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Darren W Gorman  
Examiner  
Art Unit 3752

*DWG 2/12/04*  
DWG  
February 12, 2004



**MICHAEL MAR**  
**SUPERVISORY PATENT EXAMINER**  
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